Polymeric Foam Product Manufacturing

Notes: Most districts regulate this category through their general solvent rules. Among the three districts that have rules which apply specifically to these sources, South Coast Rule 1175 has the most effective emission limits and performance requirements. However, we believe, depending on the type of foam operation, the use of lower VOC-content blowing agents, non-VOC blowing agents (or blends), or controlling emissions from more emission points in the manufacturing process could reduce VOC emissions further than are currently being achieved. Emission reductions could be realized by requiring onsite storage of the finished product for a specified time and the venting of VOC emissions from the storage area to an approved emissions control system. Where technically feasible, VOC emissions that occur during the manufacturing process, finished product storage, shipment, or consumer use could be eliminated through the use of non-VOC blowing agents.

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		Performance Standard				
The manufacturing steps of polymeric foam products. Not limited to expandable polystyrene (EPS), polystyrene foam extrusion, polyurethane, isocyanurate and phenolic foam operations.	VOCs, CFCs, or methylene chloride	X All manufacturing operations (excluding EPS molding and rigid polyurethane operations) shall by January 1, 1994 discontinue its use of CFCs, VOCs, or methylene chloride. Any polymeric cellular manufacturing operations that fail to meet this requirement shall install an approved emission control system that vents all sources of manufacturing emissions to the approved emission control system. The emission collection system shall collect at least a 90 % by weight of the manufacturing emissions; & the control	Operate controllable VOC sources by one of the following methods: 1. Exclusive use of a blowing agent other than VOCs or CFC 11 or CFC 12. 2. A collection system designed to achieve at least 90 percent VOC capture efficiency, and a thermal oxidizer which abates captured VOC emissions by at least 95 percent by weight; or 3. VOC emissions are controlled by a method which achieves an emission reduction equivalent to number 2. above and does not	A person shall not manufacture EPS foam products unless: 1. VOC emissions from such manufacture do not exceed 3.0 pounds per 100 pounds of EPS raw polymeric materials used; or 2. The raw polymeric materials used for such manufacture contain no more than 3.6 percent by weight of blowing agent, as indicated in product specifications from the manufacturer of the raw polymeric material. The Calculations of VOC emissions shall be determined by multiplying the quantity of EPS foam		

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		Performance Standard				
		device shall reduce emissions from the emission collection system by at least 95 percent, by weight.	include the use of CFC-11 or CFC-12, & approved by the APCO.	products produced by the difference between the blowing agent content of the raw polymeric materials and that of the final EPS foam products, as determined after 24 hours of storage.		
		The owner or operator of an EPS molding operation shall submit a compliance plan that demonstrates, to the satisfaction of the Executive Officer, that manufacturing emissions and post-manufacturing emissions, assuming all the blowing agent is released from the product, are less than				

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		Performance Standard				
		2.4 lbs per 100 lbs of raw material processed. Failing to meet this requirement the owner or operator shall install an approved emission control system.				
Emission control system for EPS foam manufacturing operations	VOCs in SD Rule 67.22 and SJ Rule 4682 VOCs, CFCs, or methylene chloride in SC Rule 1175	X EPS Molding operations: An approved emission control system that vents all sources of manufacturing emissions to the approved emission control system. The emission collection system shall collect at least a 90 percent by weight of the manufacturing emissions; and the control device shall	A collection system designed to achieve at least 90 percent VOC capture efficiency, and a thermal oxidizer which abates captured VOC emissions by at least 95 percent by weight; or VOC emissions are controlled by a method which achieves an emission reduction equivalent to the emission control	Includes an emission collection system which captures manufacturing emissions, and transports the captured emissions to an air pollution control device; and has a combined emissions capture and control device efficiency such that VOC emissions from manufacturing operations do not exceed 3.0 pounds per		

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		Performance Standard											
			reduce emissions from the emission collection system by at least 95 percent, by weight.		system above and does not include the use of CFC-11 or CFC-12, & approved by the APCO.		100 pounds of EPS raw polymeric materials used.						
Compliance plan	VOCs, CFCs, and methylene chloride	X	yes: Demonstrate compliance with the requirements of this rule for VOCs, CFCs, and methylene chloride.		yes: Demonstrate compliance with the requirements of this rule for VOCs only.		yes: Demonstrate compliance with the requirements of this rule for VOCs only.						

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		Performance Standard				
Storage of final products	SD: VOCS SCAQMD: VOCs, CFCs, and methylene chloride	X Emissions from the final manufactured product are vented only to the approved emission control system for at least: (I) 48 hours, in the case of expandable polystyrene molding operations that process more than 800,000 pounds per calendar year of raw material; or (II) 24 hours, in the case of all other manufacturing operations.	no storage requirement on finished product	24 hours from the time after the molding of pre-expanded materials to form the final EPS foam products.		

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		Performance Standard				
Recordkeeping		Any owner or operator subject to or granted an exemption by this rule shall maintain daily record of operations, including but not limited to the amount of raw material processed, the equipment used, and the type of blowing agent used. Such records shall be retained in the operator's files for a period of two years and be available to a District representative upon request. Owners and/or operators using an emission control system as a means of complying with this rule shall maintain daily records of the operation and	Any person subject to the provisions of this rule, including exempt facilities, shall maintain records of operation, including but not limited to the amount of material processed, the equipment used, and the type of the blowing agent used. Records shall be maintained with a minimum monthly totals with the ability to calculate daily averages in any given month. Such records shall be retained for two years, and be made available upon request. Any person using an emissions control	Maintain current records of manufacturer data for the blowing agent content of EPS raw materials used. Maintain monthly records of the amount of EPS raw materials used. For control equipment, maintain daily records of the key system operating parameters, which will demonstrate continuous operation and compliance of the emission control device during periods of emission producing activities. These records shall be		

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		Performance Standard				
recordkeeping (cont)		maintenance of the emission control system. These records shall include key system operating parameters such as temperatures, pressures, flowrates, and other measures to demonstrate compliance with the requirements of the approved emission control system, including the venting of the emissions resulting from storage of the final products.	system as a means of complying with this rule, shall maintain daily records of key system operating and maintenance procedures which will demonstrate continuous operation and compliance of the emission control device. Key system operating parameters are those necessary to ensure compliance with VOC emission requirements such as temperature, pressures, and flowrates. Such records shall be retained for two years, and be made available upon request.	retained on-site for at least three years and shall be made available to the District upon request.		

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		Performance Standard				
Test method for VOC content of materials	VOCs	X U.S. EPA Reference Method 24 (Code of Federal Regulations Title 40 Part 60, Appendix A,); The exempt solvent content shall be determined by SCAQMD Method 303 (Determination of Exempt Compounds) contained in the SCAQMD "Laboratory Methods of Analysis for Enforcement Samples" manual; or, SCAQMD Method 304 [Determination of Volatile Organic Compounds (VOCs) in Various Materials] contained in the SCAQMD "Laboratory Methods of Analysis for Enforcement Samples" manual.	none	Product specifications from the manufacturer of the raw polymeric material.		

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		Performance Standard									
Test Methods	exempt compounds	X	USEPA Test Method 18, or ARB Method 422 shall be used to determine emissions of exempt compounds.		EPA Method 18 or ARB Test Method 422 for determination of exempt compounds and halogenated blowing agents.						
Test method for determining the efficiency of emission control system	VOCs, CFCs, methylene chloride	X	The efficiency of the collection device shall be determined by the U.S. EPA method cited in 55 Federal Register 26865 (June 29, 1990), or any other method approved by the U.S. EPA, CARB, and the District. The efficiency of the control device and the VOC content in the control device exhaust gases, measured and calculated as carbon, shall be determined by		The control efficiency of any air pollution control equipment shall be determined using EPA Methods 25 and 25A for measuring total gaseous organic concentrations at the inlet and outlet of the control device. EPA Method 18 or ARB Test Method 422 for determination of exempt compounds and halogenated blowing agents		Measurement of VOC emission control device efficiency shall be conducted using EPA Methods 18, 25, and/or 25A (40 CFR 60, Appendix A), as they exist on June 7, 1994. Test procedures shall be performed in accordance with a protocol approved by the APCO. Measurements of capture efficiency shall be conducted using test			

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		Performance Standard				
		U.S. EPA Test Methods 25, 25A, or SCAQMD Method 25.1 (Determination of Total Gaseous Non-Methane Organic Emissions as Carbon) as applicable.		methods as provided above. Test procedures shall be performed in accordance with a protocol approved by the APCO. Subsequent to the initial compliance demonstration period, appropriate key system operating parameters as determined by the APCO may be used as indicators of the performance of the emission collection system.		

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		Performance Standard				
Test method for determining weight percent of blowing agents in expandable styrene polymers	pentanes	X SCAQMD Method 306 (Analysis of Pentanes in Expandable Styrene Polymers)		SCAQMD Method 306-9 (Analysis of Pentanes in Expandable Styrene Polymers)		
controllable manufacturing sources of emissions definitions	VOCs, &/or CFCs, &/or methylene chloride	Manufacturing Emissions are any emissions of VOC, CFC, or methylene chloride that occur during the manufacturing operation. Manufacturing Operation means every step of the processing of a polymeric material from the delivery of the raw material, until the storage of the final cellular product.	Controllable VOC Emission Sources: fluff silos or bins, reclaim extruders, condenser devolatizer vents, styrene recovery unit vents, and reclaim die hood exhausts in which materials manufactured with a VOC blowing agent are processed, or are stored, and from which emissions are vented to the atmosphere.	Manufacturing Emissions" means VOC emissions which occur during the manufacturing of EPS foam products, from the delivery of the raw polymeric materials to the manufacturing site to 24 hours after the molding of pre-expanded materials to form the final EPS foam products.		

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		Performance Standard				
VOC definition	VOCs	VOC is any volatile compound of carbon, excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and exempt compounds	VOC means any volatile compound containing at least one atom of carbon excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonates, and exempt compounds which may be emitted to the atmosphere from EPS foam products manufacturing operations subject to this rule.	Defined in Rule 1020		

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		Performance Standard				
Raw materials (polymeric materials) and blowing agents definitions	VOCs, resins, methylene chloride, CFCs, and polymerized polymers	Raw material: all polystyrene beads, polyurethane, and blowing agent used in the manufacture of polymeric cellular products.	Polymeric material: a multi-colored compound or mixture of compounds formed by polymerization and consisting essentially of repeating structural units.	not defined		
blowing agent definition	VOCs, CFCs, and methylene chloride	Blowing agent means a liquid, gaseous or solid material that facilitates the formation of a cellular product from raw polymeric material.	Blowing Agent: any liquid, or gaseous material, including VOCs, that facilitates the formation of a cellular product from raw polymeric material.	Blowing agent means a liquid or gaseous volatile organic compound that facilitates the formation of an EPS foam product from polymeric raw materials.		

Table II
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Rule/Measure	Rule/Measure				
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Exemptions	The emission control requirements of this rule shall not apply to any: (A) Expandable polystyrene operation that processes less than 200 pounds per day of raw material. (B) Rigid polyurethane operation that processes less than 1,000 pounds per day of raw material. The venting of emissions from the final manufactured product shall not apply to any facility that only manufactures: (A) rigid polyurethane foam; or (B) EPS foam and the highest concentration of the blowing agent in the cellular product is 1.8 percent or less by weight within 15 minutes of completion of the manufacturing operation. Verification of the concentration shall be demonstrated annually, pursuant to a protocol submitted to the District and subject to approval by the Executive Officer.	**The provisions that require use of one of the following**: A blowing agent other than a VOC or CFC 11 or CFC; or a collection system that achieves at least 90 % capture efficiency and 95% destruction efficiency; or by a method that achieves emission reductions equivalent to the collection system **shall not apply** to manufacturing and processing operations using polymeric materials containing less than 1 percent volatile organic compounds by weight, and not using a blowing agent in their process. However, the rule does not contain any provision (test methods or procedures) to verify the VOC content of polymeric materials.	The requirements that a person shall not manufacture EPS foam products unless VOC emissions from such manufacture do not exceed 3.0 pounds per 100 pounds of EPS raw polymeric materials used; or the raw polymeric materials used for such manufacture contain no more than 3.6 percent by weight of blowing agent, as indicated in product specifications from the manufacturer of the raw polymeric material shall not apply to any stationary source with uncontrolled VOC emissions of less than 50 tons per calendar year from EPS foam products manufacturing operations. The Calculations of VOC emissions shall be determined by multiplying the quantity of EPS foam products produced		

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			by the difference between the blowing agent content of the raw polymeric materials and that of the final EPS foam products, as determined after 24 hours of storage.		
Applicability	This rule shall apply to polymeric cellular products manufacturing operations including but not limited to expandable polystyrene, polystyrene foam extrusion, polyurethane, isocyanurate and phenolic foam operations. All steps of the manufacturing operation and the storage of the final product for a maximum of 48 hours are subject to the requirements of this rule.	The provisions of this rule shall apply to any polystyrene foam, polyethylene, and polypropylene manufacturing and processing operations.	Except as otherwise provided in the exemptions mentioned above, this rule is applicable to any person who manufactures expandable polystyrene (EPS) foam products using volatile organic compounds (VOC's) as blowing agents. EPS foam products manufacturing operations subject to this rule shall not be subject to Rule 66.		

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Comments	Overall this rule is more effective in reducing emissions at any given manufacturing operation. All sources of manufacturing emissions are controlled by the approved emissions control device (95%, by weight) and the collection system (90%, by weight).	This rule appears to have the same emissions control system requirements as the SCAQMD Rule 1175. However, Rule 4682 does not require collection and destruction of emissions from other significant sources of emissions. Most of the emissions from these types of operations are fugitive emissions. This rule excludes a number of sources of emissions, such as storage of finished products, curing areas and others. Further, the staff report stated that all sources were in compliance with this rule prior to its adoption. Therefore, this rule has no emission reduction potential in this district.	The staff report stated this rule would only apply directly to one facility in the District. The rule proposed two options that were technically and economically feasible. One would realize an annual reduction in emissions of 81%, and the other would realize an annual reduction in emissions of 40%. The district chose the lower percent reduction option.		